Kansas Space Grant Consortium
Wichita State University
L. Scott Miller
Telephone Number: 316-978-6334
Consortium URL: http://www.nasainkansas.org
Grant Number: NNX11AE14H

PROGRAM DESCRIPTION

The National Space Grant College and Fellowship Program consists of 52 state-based, university-led Space Grant Consortia in each of the 50 states plus the District of Columbia and the Commonwealth of Puerto Rico. Annually, each consortium receives funds to develop and implement student fellowships and scholarships programs; interdisciplinary space-related research infrastructure, education, and public service programs; and cooperative initiatives with industry, research laboratories, and state, local, and other governments. Space Grant operates at the intersection of NASA's interest as implemented by alignment with the Mission Directorates and the state's interests. Although it is primarily a higher education program, Space Grant programs encompass the entire length of the education pipeline, including elementary/secondary and informal education. The Kansas Consortium is a Program Grant Consortium funded at a level of $430,000 for fiscal year 2012.

PROGRAM GOALS

The following program goals are a continuation from the previous year, no changes were deemed necessary.

Fellowship and Scholarship Program goals:

> Provide undergraduate and graduate fellowships, scholarships and teaching assistantships that support STEM education. Including support for women, underrepresented minorities, and persons with disabilities in STEM education and careers
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> The related objectives are as follows:
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> Competitively fund fifty (50) undergraduate twenty-five (25) graduate students in experience-based research and STEM-related projects each year. The annual Fellowship and Scholarship level should resemble the Kansas underrepresented and female student enrollment percentages (i.e., 18% and 40%, respectively). Competitively support at least one (1) student with disabilities each year

Research Infrastructure Program goals:

> Support research internships, mentorships, collaborations, and partnerships with NASA center and industrial partners. Provide modest funding to support NASA

relevant research opportunities. Promote interdisciplinary NASA-relevant research collaboration between non-PhD granting colleges, research-intensive universities, industry, and NASA Centers. Successfully involve women, underrepresented minorities, and persons with disabilities.

The related objectives are as follows:

Annually fund ten (10) students to work at NASA centers, on NASA-supported or NASA-relevant research projects, or with the aerospace industry. Support two (2) students each year on NASA Academy appointments. Fund at least one (1) new faculty member per year to develop NASA relevant research capabilities. Provide support for at least one (1) interdisciplinary and collaborative NASA-relevant research group that includes a double-combination of participants from a non-PhD granting college, a research-intensive university, industry, and/or a NASA Center. Participation level should resemble the Kansas underrepresented and female student enrollment percentages (i.e., 18% and 40%, respectively) and should competitively support at least one (1) student with disabilities each year.

Higher Education Program goals:

Support university student groups participating in NASA-relevant experience-based activities. Enhance university STEM academic program or course content development - especially at non-PhD granting universities. Provide opportunities for students to explore STEM careers as faculty. Successfully involve women, underrepresented minorities, and persons with disabilities

The related objectives are as follows:

Competitively fund at least five (5) university student teams, involving approximately twenty (20) students total, who participate in statewide, national, or international STEM-related competitions each year. Annually fund at least one (1) university to perform STEM academic program or course development, especially at non-PhD granting universities. Support two (2) students each year via STEM-related graduate teaching assistantships. The annual Higher Education program student participation level should resemble the Kansas underrepresented and female student enrollment percentages (i.e., 18% and 40%, respectively) and competitively support at least one (1) student with disabilities each year.

Precollege Education Program goals:

Enhance precollege student education by providing STEM workshop training for teachers. Assist in the development of instructional content that use emerging NASA-developed technology. Actively involve women, underrepresented minorities, and persons with disabilities

The related objectives are as follows:

Annually fund three (3) in-service teacher workshops that support twenty-five (25) pre-college STEM teachers. Contribute to the development of one (1) new or enhanced pre-college STEM course or program each year. Precollege Education

program teacher participation level should resemble the Kansas underrepresented and female student enrollment percentages (i.e., 18% and 40%, respectively). Support at least one (1) pre-college teacher with disabilities each year.

Public Service (Informal Education) Program goals:

Stimulate public interest in STEM by providing information and activities to increase public appreciation for the direct and indirect benefits of NASA-sponsored research. Involve women, underrepresented minorities, and persons with disabilities in all aspects of the Public Service programs

The related objectives are as follows:

Annually fund, at modest levels, experiences involving at least two-hundred (200) people highlighting STEM and NASA-related interests. The Public Service program participation level should resemble the Kansas underrepresented and female student enrollment percentages (i.e., 18% and 40%, respectively). Including at least one (1) participant or public member with disabilities each year

Diversity goals:

Aggressively attract, support, and retain women, underrepresented minorities, and persons with disabilities within the consortium's Fellowship and Scholarship, Research Infrastructure, Higher Education, Precollege, Public Service programs and Consortium Management.

The related objectives are as follows:

The annual Fellowship and Scholarship, Research Infrastructure, and Higher Education program participation levels should resemble the Kansas underrepresented and female student enrollment percentages. Annually retain 85% of the previously funded underrepresented, female, and persons with disabilities in STEM areas as they take their next step. The annual Precollege and Public Service program participation level should resemble the Kansas underrepresented and female student enrollment percentages.
Support at least five (5) consortium program participants with disabilities each year
Involve at least four (4) women, underrepresented minorities, or persons with disabilities in consortium management and administration.

Workforce development goals:

Aggressively recruit undergraduate and graduate students to the consortium's competitive Fellowship and Scholarship, Research Infrastructure, and Higher Education programs and work to retain them. Recruit and competitively support women, underrepresented minorities, and persons with disabilities within the consortium's Fellowship and Scholarship, Research Infrastructure, and Higher Education programs

The related objectives are as follows:

Competitively fund at least fifty (50) consortium undergraduate students participating in noteworthy educational activities each year with Fellowships or Scholarships. Competitively fund at least twenty-five (25) consortium graduate students with STEM field research or teaching assistantships each year. Annually fund ten (10) students to work at NASA centers, on NASA-supported or NASA-relevant research projects. Assist at least two (2) students each year with NASA Academy appointments. Assist at least two (2) students each year with STEM-related industry appointments. Fund at least two (2) students each year via STEM-related graduate teaching assistantships. The annual Fellowship and Scholarship, Research Infrastructure, and Higher Education program student participation level should resemble the Kansas underrepresented and female student enrollment percentages.

Competitively support at least three (3) students with disabilities in the Fellowship and Scholarship, Research Infrastructure, and Higher Education programs each year. Retain 85% of funded Fellowship and Scholarship, Research Infrastructure, and Higher Education students in STEM areas as they take their next step.

Longitudinal tracking system goals:

Maintain a robust tracking method. Define meaningful, consortium or affiliate specific, tracking criteria. Reasonably identify longitudinal tracking system trends, strengths, and weaknesses.

The related objectives are as follows:

Successfully track at least an 85% of the students who receive significant consortium support from the Fellowship and Scholarship, Research Infrastructure, and Higher Education programs. The Executive committee will evaluate longitudinal tracking method trends, strengths, and weaknesses periodically, offering recommendations for changes as needed

Minority Serving Institution related goals for Haskell Indian Nations University:

Preserve and, if possible, grow Haskell's participation within the consortium. Provide funding to support STEM faculty, student, and program development. Create collaborative opportunities for Haskell faculty and students, both within and outside the state.

The related objectives are as follows:

Maintain the Haskell affiliate representative's active involvement in consortium management. Support at least five (5) Haskell students each year with funds for STEM related experiences. Annually support at least three (3) Haskell faculty with funds for professional development and support the development of at least one (1) STEM related academic program every two-years. Engage, collaboratively, at least two (2) Haskell students or faculty yearly within consortium, NASA, or industry Research Infrastructure or Higher Education activities.

Management goals:

The central office, director, and affiliate representatives will provide leadership that fosters success in meeting consortium objectives. The leadership will maintain continuous improvements to meet NASA and Kansas objectives. We will strive to maintain effective services and communications that allow affiliates to concentrate mainly on achieving goals and objectives, represent NASA and the KSGC at the state and national level, and seek to expand consortium resources. Additionally, the management elements will coordinate research with non-Space Grant NASA programs having similar objectives, such as NASA EPSCoR Program.

The related objectives are as follows:

The Director will submit an annual report to NASA and the Consortium Management analyzing the state of the consortium, based on the consortium's SMART Objectives. Promote active consortium participation by holding at least one (1) face-to-face and three (3) teleconference Executive Committee meetings (with full attendance) each year. The Executive and Advisory Committees will review and update (if needed) the KSGC Strategic Plan and Policies and Procedures (including the management organization) documents every year. The Central Office will maintain an up-to-date 508-compliant web site, outlining consortium contact information, NASA and Kansas goals, a summary of significant programs, a listing of opportunities, and appropriate links. The consortium should expend at least 95% of the consortium base and competitive funds each year. The Director and appropriate Central Office staff will attend at least two (2) National and one (1) Regional Space Grant meeting each year
The Director will be involved in at least one (1) national, regional, or out-of-state Space Grant group each year (e.g., Executive Committee, etc.). The consortium will seek additional funding from at least one additional source each year (e.g., augmentation awards, industry, other NASA, etc.)

PROGRAM/PROJECT BENEFIT TO OUTCOME (1, 2, OR 3)

The Kansas consortium's Fellowship/Scholarship and Research Infrastructure programs have again involved a large number of students in significant experiential activities. This year over 200 students were supported via the grant. Underrepresented students made up 25% of the total (exceeds the 18% target). Women made up 34% of the total (6% short of the 40% target).

As a result of consortium support, student teams participating in STEM competitions have continued to demonstrate success. Kansas teams participated in the international American Institute of Aeronautics and Astronautics (AIAA) Design/Build/Fly, NASA Moon buggy, AUVSI, SAE Aero Design, and NASA Senior Design competitions.

Interestingly, a WSU rocket team achieved its goal of designing, building, testing and flying a rocket to 16,000 ft. These efforts provided extensive hands-on (i.e. experiential) opportunities for elementary schools students (three classes & about 100 student payloads), undergraduate, and graduate students.

Consortium STEM teacher in-service workshops continue to have a major impact within the state. The programs are very popular, though this year only two workshops were organized (a third has just started). Feedback from participating teachers has again been extremely positive and constructive. We are convinced that the teachers who go through these programs are having a wide-reaching impact on middle and high school students statewide.

PROGRAM ACCOMPLISHMENTS

The following outlines program accomplishments relative to the goals and objectives noted in the Program Goals section above.

- Outcome 1

  NASA's Outcome 1 remains the KSGC's primary area for focus, especially via Fellowship, Scholarship, Research Infrastructure, and Higher Education awards.

  Current results are listed below. A plus (+) or minus (-) sign, placed at the end of each line, is used to identify if the outcome is above or below the consortium target value.

  - 162 competitively funded Fellowship/Scholarship undergraduate students participated in noteworthy educational activities (+)
  - 18 graduate students were funded competitively with STEM research or teaching assistantships (+)
  - 35% of the Fellowship/Scholarship students are underrepresented (+) and 37% are female (-)
  - 2 Fellowship/Scholarship student with disabilities participated (+)
  - 9 students worked at NASA centers, on NASA-funded or NASA-relevant research projects, or with the aerospace industry (-1)
  - 6 students were supported on NASA Academy appointments (+4)
  - 8 new faculty members were supported to develop NASA relevant research capabilities (+7)
  - 1 interdisciplinary and collaborative NASA-relevant research groups was supported (meets goal)
  - 0% of the Research Infrastructure students were underrepresented (-) and 100% were female (+)
  - No Research Infrastructure students with disabilities participated (-)
  - 89 students worked on 8 different funded student teams (+)
  - 8 new STEM-related academic program or course developments were supported (+)
  - 5 students were funded with STEM-related graduate teaching assistantships (+)

- 0 students were funded this year with STEM-related undergraduate teaching assistantships (no set goals)
- 7% of the Higher Education students are underrepresented (-) and 11% are female (-)
- 1 Higher Education student with disabilities participated (meets goal)

As you can see, the Kansas consortium has done very well; we have exceeded almost all Outcome 1 goals. Fellowship/Scholarship, higher education, and research infrastructure participation levels for women are about 6% below the target level. However, underrepresented student participation is above the 18% target.

- Outcome 2

  Outcomes 2 are important and addressed via student team sponsorships and, especially, teacher in-service workshops.

  As before, current results are listed below. A plus (+) or minus (-) sign, placed at the end of each line, is used to identify if the outcome is above or below the consortium target value.

  - 8 competitively funded university student teams participated in statewide, national, or international STEM-related competitions (+)
  - 2 in-service teacher workshops were funded (-1)
  - Supported 27 pre-college STEM teachers (+)
  - 16 new or enhanced pre-college STEM courses or programs were supported (+)
  - 6.5% of the Precollege Education teachers were underrepresented (-) and 51% were female (+)
  - 0 pre-college teachers with disabilities participated (-)

  Though the consortium has done extremely well, especially in involving women teachers, underrepresented teacher and teachers with disability participation is significantly lower than desired this year. Generally the teacher workshops are very well received by the teachers and we have very good feedback.

- Outcome 3

  Outcomes 3 are important and addressed via affiliate public interactions. Current results are:

  - 3,227 public participants have been involved in funded experiences highlighting STEM and NASA-related interests (+)
  - About 4.5% of the public participants were underrepresented (-) and 13.2% were female (-)
  - 54 of the public participants were disabled (+)

  These results are significant. The Kansas Cosmosphere and Space Center, University of Kansas, Emporia State University, and Fort Hays State University continue to support significant public service activities.

However, it is important to recognize that public participant reporting is a challenge. The accuracy of these reported public participation numbers is not as high as the student tracking results.

PROGRAM CONTRIBUTIONS TO PART MEASURES

- Student Data and Longitudinal Tracking:

  The consortium affiliates are actively tracking current and past student participants. Current results are as follows:

  - The status of 564 students, who received significant consortium support from the Fellowship and Scholarship, Research Infrastructure, and Higher Education programs, is currently known
  - 97.7% of the current and past students are being tracked (unfortunately, we can no longer track 13 students)

  These tracking numbers change as students fall off at the "next step" and new students are added each year.

  We are continually improving our tracking ability; we have added a Facebook page and have also been looking at developing automated worksheets to better track our students once they are in the system.

- Diversity:

  The consortium has made some progress in meeting diversity goals and targets. As has been noted, underrepresented student involvement is up notably. However, female involvement is slightly higher than last year but 6% lower than desired.

  The affiliates will continue to work toward improving and maintaining diverse participation in consortium activities. Overall, despite the slight shortfall, the affiliates feel positive about the results.

- Minority-Serving Institutions:

  Haskell Indian Nations University (HINU) is an active member of the Kansas space grant.

  Forty two (42) HINU students were involved in NASA relevant STEM experiences. One - KSGC supported Haskell faculty worked through 3 courses to provide these experiences. The consortium continues to find ways to include Haskell in future research and STEM experiences.

- NASA Education Priorities:

In the past year, the consortium offered exciting workshops to engage schoolteachers, such as: the "Kansas Cosmosphere and Space Center Teachers in Space" and Fort Hays State University's "Robotics for Underserved Middle Schools in Kansas" workshops.

Kansas Cosmosphere and Space Center and FHSU hold hugely popular informal education programs for school children year round.

IMPROVEMENTS MADE IN THE PAST YEAR

The consortium has sustained significant gains in improving reporting processes and procedures. Furthermore, we have also been very successful in tracking students and in accumulating anecdotal evidence of success. However, as we become more familiar with the OEPM reporting system additional material will be needed from the Affiliates.

Over the last year, to improve diversity, the consortium leadership focused additional efforts on increasing awareness of opportunities to underrepresented and female students. As has been noted, the impact of this effort is significant for underrepresented students (we are now 7% above the target). However, the impact for females was lower than desired for female students (a 1% increase from last year, but still 6% short of the target level).

Affiliates will continue their efforts to improve participation of both women and underrepresented students in consortium activities.

PROGRAM PARTNERS AND ROLE OF PARTNERS IN PROJECT EXECUTION

The following information outlines the characteristics of the consortium affiliate members:

- Emporia State University (ESU) - approximately 7,000 students, with four major colleges including Business, Liberal Arts and Sciences, School of Library and Information Management, and the Teachers College (non-Ph.D. granting)
- Fort Hays State University (FHSU) - approximately 9,000 students, with four major colleges including Arts and Sciences, Education and Technology, Business and Leadership, and Health and Life Sciences (non-Ph.D. granting)
- Haskell Indian Nationals University (HINU) - approximately 1,000 students, the U.S. Bureau of Indian Affairs Native American University (non-Ph.D. granting)
- The Kansas Cosmosphere and Space Center (KCSC) - a world-class space science museum
- Kansas State University (KSU) - a STEM Ph.D. granting institution, with approximately 23,000 students, nine major colleges including Arts and sciences, engineering, education, and agriculture

- Pittsburg State University (PSU) - approximately 7,000 students, with four major colleges of Arts and Sciences, Business, Education, and Technology (non-Ph.D. granting)
- University of Kansas (KU) - a STEM Ph.D. granting institution, with approximately 30,000 students, eighteen major colleges including Liberal Arts and sciences, engineering, education, and medicine
- Wichita State University (WSU) - a STEM Ph.D. granting institution, with approximately 15,000 students. Includes the National Institute for Aviation Research that provides experiential student training in addition to research.

The National Space Grant Office requires two annual reports, the Annual Performance Data Report (APD) and the Office of Education Performance Measurement System (OEPM) report. The former is primarily narrative and the latter data intensive. Because the reporting timeline cycles are different, data in the two reports may not necessarily agree at the time of report submission. OEPM data are used for official reporting.